

REMARKS

Enclosed herewith are an excess claims fee letter and fee.

Claims 1, 4, 10-13, 15-21, 23-25, and 27-33 are all the claims presently pending in the application. Claims 14, 22, and 26 are canceled above. New claims 29-33 are added.

It is noted that, notwithstanding any claim amendments made herein, Applicant's intent is to encompass equivalents of all claim elements, even if amended herein or later during prosecution.

The Examiner objects to claims 14, 16, 20, 23, and 26.

Claims 1, 10-12, and 14 stand rejected under 35 USC §102(e) as being anticipated by US Patent 6,069,990 to Okawa. Claims 24 and 25 stand rejected under 35 USC §102(e) as being anticipated by US Patent 6,188,818 to Han et al. Claims 4, 13, and 15 stand rejected under 35 USC §103(a) as unpatentable over Okawa, further in view of Japanese Patent JP 10-197735 to Okamoto. Claims 16-21 stand rejected under 35 USC §103(a) as unpatentable over Han, further in view of Okawa. Claim 22 stands rejected under 35 USC §103(a) as unpatentable over Han, further in view of Okawa, and further in view of US Patent 5,002,350 to Dragone. Claim 23 stands rejected under 35 USC §103(a) as unpatentable over Han/Okawa, further in view of Okamoto. Claim 26 stands rejected under 35 USC §103(a) as unpatentable over Han, further in view of Okawa. Claims 27 and 28 stand rejected under 35 USC §103(a) as unpatentable over Han/Okawa, further in view of Okamoto.

These rejections are respectfully traversed in view of the following discussion.

I. THE CLAIMED INVENTION

Applicant's invention, as disclosed and defined in claim 1, is directed to an arrayed

waveguide grating including a substrate. A first channel waveguide is disposed on the substrate and receives a multiplexed optical signal. A channel waveguide array is disposed on the substrate and constituted such that each length of waveguides is sequentially longer with a predetermined difference between the lengths of the waveguides.

A first slab waveguide is disposed on the substrate and connects the first channel waveguide with the channel waveguide array. A second slab waveguide is disposed on the substrate and connects an end of the channel waveguide array on the side that the first slab waveguide has not been connected thereto.

As a result, problems with a parabolic loss characteristic due to sudden changes in output levels and modulation problems due to narrowed transmission widths in the case of connected arrayed waveguide gratings are reduced (Application, p. 2, lines 25-29).

In complete contrast, a conventional arrayed waveguide grating repeats loss characteristics with respect to optical frequency and exhibits a more precipitous parabolic configuration in the vicinity of the central frequency. Thus, communications problems emerge where a wavelength of a laser light source deviates from its central frequency and optical modulation components are easily cut off (e.g., see specification, p. 3, lines 15-25).

In a key feature of an exemplary embodiment of the present invention, the waveguide part in the connected area of the second (output) channel waveguide is formed as a parabolic portion. A key advantage of this exemplary configuration is that the waveform outputted through the second channel can be flattened and the waveform flattening can be adjusted independently for each of the output channel waveguides (e.g., for each wavelength λ_1 through λ_n).

II. THE CLAIM OBJECTIONS

The Examiner objects to claims 14, 16, 20, 23, and 26 for referring to a "second" parabolic part. Applicant believes that the above claim amendments address the Examiner's concerns and accordingly requests that the Examiner reconsider and withdraw the above-identified claim objections.

III. THE PRIOR ART REJECTIONS

The Examiner alleges that Okawa anticipates the present invention as defined by claims 1 and 10-12, since the Examiner considers that the description at lines 36-42 of column 7 allows that the light enter from the output and exits from the input. However, the mere reversal of the light would not cause Okawa to read on the present invention, since claim 1 additionally defines that the input be a multiplexed light signal. The mere reversal of signal in Okawa would not correct this basic deficiency. That is, the parabolic configuration of the waveguides in Okawa is done on the input channel waveguides, not the output channel waveguide, when viewed in terms of the input signal as being the multiplexed optical light.

Hence, turning to the clear language of the claims, in Okawa, there is no teaching or suggestion of: "... a first channel waveguide disposed on the substrate for receiving a multiplexed optical signal; ... and a second channel waveguide disposed on said substrate and connected to the other end of said second slab waveguide, wherein a waveguide part in the connected area has a parabolic configuration", as required by claim 1.

The Examiner also alleges that Han anticipates claims 24 and 25. However, claim 24 has been amended to clarify that a key feature of the present invention is the parabolic configuration of each output channel waveguide at the connection to the second sector form

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slab waveguide. As clearly shown in Figure 3, Han has a taper shape to the output waveguide.

Hence, turning to the clear language of the claims, in Okawa, there is no teaching or suggestion of: “ ... wherein a waveguide part of each optical waveguide of said output channel waveguide that is connected to said second sector form slab waveguide is shaped in a parabolic configuration”, as required by claim 24.

The Examiner alleges that Okawa, as modified by Okamoto, renders obvious the present invention as defined by claims 4, 13, and 15, that Han, as modified by Okawa, renders obvious the present invention as defined by claims 16-21 and 26, that Han/Okawa, as further modified by Dragone, renders obvious the present invention as defined by claim 22, and, as further modified by Okamoto, renders obvious the present invention as defined by claims 23, 27, and 28.

Although Applicant does not consider that the combination of references is proper, such combination would be irrelevant, since none of the modifications would overcome the deficiency identified above for Okawa and Han.

For at least the reasons stated above, Applicant respectfully submits that the cited references fail to teach or suggest every feature of present invention as defined by the claims.

Based on the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejection.

IV. INFORMAL MATTERS AND CONCLUSION

The Examiner also objects to the drawings/specification for failing to explain the difference between “z” and “Z”. Applicant believes that the specification change above properly addresses the Examiner’s concerns and respectfully requests that the Examiner

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reconsider and withdraw this objection.

In view of the foregoing, Applicant submits that claims 1, 4, 10-13, 15-21, 23-25, and 27-33, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance.

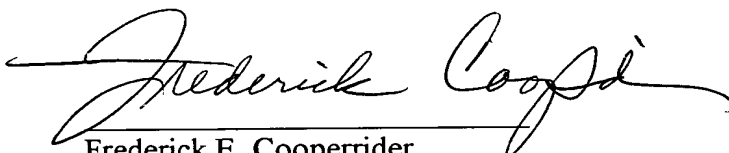
Should the Examiner find the application to be other than in condition for allowance, the Examiner may contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorneys Deposit Account No. 50-0481.

Respectfully Submitted,

Date:

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